



Concussion Reference Guide

Children's Healthcare of Atlanta Concussion Program

choa.org/concussion

Children's Healthcare of Atlanta is dedicated to protecting our youth. This document is intended to serve as a guideline or a user's manual for local school boards and governing bodies who are tasked with developing and implementing a concussion policy for their district.



Children's
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Dedicated to All Better

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This is general information and not specific medical advice. Always consult with a doctor or healthcare provider if you have questions or concerns about the health of a child. This piece was created by the concussion team at Children’s Healthcare of Atlanta.

Return to Play Act of 2013

On April 23, 2013, Governor Nathan Deal signed into law House Bill 284, the “Return to Play Act of 2013,” at a ceremony held at our Scottish Rite hospital. This legislation is aimed at developing return-to-play policies for youth athletes who are concussed during a game, educating parents on the risks of concussions and preventing Second Impact Syndrome (SIS). The return-to-play policies are based on three guiding principles in the management of concussions:

- **Educate**—Educate athletes, parents, coaches, officials, administrators (school and league) and teachers on the importance of early recognition of concussive injury and risk of returning to play before complete recovery
- **Recognize**—Recognize the signs and symptoms of concussion early so the athlete can be removed from play immediately and the concussion management plan can be implemented
- **Return to Play**—Remove all athletes who are suspected of suffering a concussion from play immediately. Do not allow them to return to play until they have been evaluated and cleared by a medical professional trained in the management of concussions

Schools

HB 284 requires all local boards of education and governing bodies of non-public, state and charter schools to develop a concussion policy with the following components:

- Prior to the beginning of each athletic season, an information sheet that informs parents or legal guardians of the risk of concussions must be provided.
- If a youth athlete (ages 7 to 18) participating in a youth athletic activity exhibits signs or symptoms of a concussion, he must be removed from play and evaluated by a healthcare provider.
- Before a youth athlete can return to play, he must be cleared by a healthcare provider trained in the management of concussions.

Recreational leagues

Additionally, HB 284 requires recreational leagues to provide an information sheet on the risks of concussion at the time of registration to all youth athletes’ (ages 7 to 18) parents or legal guardians. Leagues are strongly encouraged to adopt a concussion management policy consistent with the school requirements.



A sample concussion policy can be found in the appendix.

Concussion overview

Over the past several years, there has been a media storm surrounding sports-related concussions. It seems that one can't watch a sporting event over a weekend without hearing about a high-profile athlete missing playing time because of a concussion. Concussions may be occurring at a higher frequency among athletes, but probably a more significant reason is that public awareness about concussions is at an all-time high.

The Centers for Disease Control and Prevention (CDC) estimates between 1.6 and 3.8 million sports-related concussions occur annually in the U.S. and account for 5 to 90 percent of all sports-related injuries. Thirty percent of all concussions in individuals between 5 and 19 years of age are sports related and result in a significant number of emergency department visits. The majority of concussions occurring in organized sports in the U.S. are sustained in football, ice hockey, wrestling, girls soccer, boys soccer and girls basketball. As lacrosse continues to grow in popularity, more concussions will result from that sport as well. In high school sports with the same rules—such as basketball and soccer—there is an increased incidence of concussions reported in females.

Concussions occur off the playing fields as well. Home, bicycle and playground falls can also result in a concussion. The same principles that apply to sports-related concussions also apply to non-sports related concussions. Namely, recognition that an injury has occurred with appropriate treatment, including supervised return to play, is important.

What is a concussion?

There are many accepted definitions of concussion but a very easy-to-understand definition is as follows:

Concussion is a form of traumatic brain injury (TBI). This injury can occur as a result of a blow to or around the head that causes acceleration forces to the brain. This movement of the brain within the skull causes a functional disturbance in how the brain works or processes information (also known as transient alteration in cognitive functioning).

It is important to remember that:

- A concussion usually does not result in loss of consciousness (LOC) (90 percent of cases do not involve LOC)
- Headache is the most common symptom, but it does not have to be present

- Since a concussion does not involve a structural injury to the brain, standard imaging, such as CT and MRI, is normal

What happens in the brain during a concussion?

A concussion results in a disturbance in the brain's ability to process information or function. The individual's abilities to concentrate, reason, remember, solve problems and learn new information are compromised. Contrary to popular belief, it is not a bruise to the brain. There is usually no detectable bruising, swelling or bleeding in the brain. When the head is struck, the brain accelerates inside the skull opposite the direction of the blow. It is this acceleration force that causes the functional disturbance in the brain.

This acceleration force causes the chemical balance in the brain to be disrupted. It is possible that there is a chemical disturbance to the neurons (nerves) within the brain. It is this chemical imbalance that limits the brain's ability to function properly. The brain will eventually need increased blood flow to provide nutrients so the brain cells or neurons can recover and correct the chemical imbalance. Some studies, however, report that the blood flow to the concussed brain is decreased, thus limiting the brain's ability to recover. This creates a supply-and-demand mismatch of energy being provided to the concussed brain. Only when proper blood flow is restored can the brain recover completely. This process often takes several weeks.

Recognizing the signs and symptoms of a concussion

A concussion can be diagnosed by various signs and symptoms that are observed in the injured athlete. The actual injury may not have been directly witnessed, so any athlete who is suspected of suffering a blow to the head, has fallen from a height or collides with another person or object may have sustained a concussion.

- **Symptoms** are feelings that the athlete reports. They include headache, nausea, difficulty concentrating and memory loss.
- **Signs** are conditions that are noticed by others, such as coaches, parents and teammates. They include poor coordination, vomiting, memory loss, and appearing confused or "out of it."



Signs and symptoms usually appear within minutes after the injury. However, they can appear later—for several hours or several days after the injury. If a school staff member observes a student displaying signs or symptoms of a concussion, he should accompany the student to the school nurse. If there is no school nurse or he or she is unavailable, the parent or guardian must be contacted. In accordance with the Return to Play Act of 2013, any student suspected of having a concussion, either from direct observation of the head injury or from reported symptoms, must be removed from physical activities. If there is a suspected concussion, he should also not participate in recess or PE class. The student should be observed and referred to a medical provider for evaluation if needed.

Signs observed by staff

- Appears dazed or stunned
- Confused about assignment
- Forgets plays
- Is unsure of game or opponent
- Moves clumsily
- Answers questions slowly
- Loses consciousness (even temporarily)
- Shows behavior or personality changes
- Forgets events prior to hit (retrograde amnesia)
- Forgets events after hit (anterograde amnesia)

Symptoms reported by athlete

- Headache
- Nausea
- Balance problems
- Dizziness
- Double vision
- Fuzzy vision
- Sensitivity to light or noise
- Feeling sluggish
- Feeling foggy
- Change in sleep pattern
- Concentration problems
- Memory problems



Concussion management

Immediate post-concussion management

If any athlete suffers a suspected blow to the head and exhibits any of the above signs or symptoms, he should be immediately removed from play and evaluated. The evaluation ideally should include standard emergency management principles and be performed by a licensed physician, certified athletic trainer or registered nurse trained in the assessment and management of concussions. Unfortunately, trained medical personnel are not always immediately available. Therefore, a coach should be comfortable and familiar with the basic sideline assessment for concussions.

Note: Be aware that cervical spine or neck injuries may occur with a concussion. Any report of neck pain or numbness in the arms or legs should prompt staff to keep the athlete motionless on the field with a neck collar applied. In case of an urgent concern or emergency, call 911 and seek emergency medical assistance. DO NOT ATTEMPT TO REMOVE THE HELMET.

Recognize

The initial step in the sideline assessment is recognizing that a concussion may have occurred. This is often difficult because athletes don't always report their symptoms. He may not be aware he has been concussed or may not report symptoms for fear of losing playing time, his position on the team or respect from teammates and coaches. There are other conditions that result in signs and symptoms similar to a concussion such as dehydration, heat illness and low blood sugar.

Sideline assessment tools were developed by Children's to aid the caregiver in more accurately diagnosing concussion. See appendix for sideline tools.

Notify

If a concussion did occur, the athlete's parent or guardian should be notified immediately. Appropriate disposition will be determined by a healthcare provider. If there is no licensed healthcare provider immediately available, the student-athlete should be referred to a medical facility for evaluation.

If the athlete demonstrates any of the following symptoms at any time during the evaluation or observation period,

immediate referral to a healthcare facility via ambulance is warranted:

- Worsening headache
- Persistent vomiting
- Altered mental status
- Seizure
- Slurred speech
- Trouble recognizing people or places
- Tiredness or hard to wake
- Blood or fluid coming from the nose or ear
- Weakness in the arms or legs

The cornerstone of proper concussion management is both cognitive and physical rest, until symptoms improve followed by a gradual return to school and sports. Without cognitive and physical rest, symptoms may worsen and prolong recovery. The school should receive written recommendations from a physician for physical and cognitive rest. These recommendations must be followed both at school and home.

A guardian concussion notification template can be found in the appendix.

Cognitive rest: Strategies for returning to school

The chemical disturbance resulting in the supply-and-demand mismatch in the brain require rest in order to recover. Any task requiring the brain to think, concentrate, remember and reason stresses the concussed brain beyond its capability, prolongs recovery and may even worsen symptoms.

Such tasks include:

- Watching television
- Playing on computers and video games (even on small smart phone screens)
- Texting or social media
- Studying or doing homework
- Reading or writing
- Bright lights
- Loud music

As the symptoms improve, the student may be able to complete some schoolwork at home in a quiet environment. When the child is ready to go back to school, he should follow



a gradual return with an academic recovery plan developed by the school.

Academic recovery plan

In conjunction with a student and his parents or guardians, the school will develop an academic recovery plan (ARP). This will consist of instructions to monitor the student for mental activities that worsen the signs and symptoms of a concussion. Any activity that produces or worsens signs and symptoms of a concussion should be ceased. The ARP will also develop and recommend academic modifications for the student as he returns to school.

Such academic modifications may include:

- A shorter school day
- Only attending core classes and resting in the school nurse's office during non-core classes
- Providing the student with pre-printed class notes
- Not giving quizzes or tests
- Alternative assignments
- Allowing students to audiotape classes
- Providing assignments in writing
- Preferential seating to minimize distractions
- Eating lunch with a friend in the school nurse's office
- Leaving class five minutes early to avoid noisy hallways
- Shortened homework assignments

Initially, the student may be able to complete only a couple hours of school. As he continues to recover, he will be able to accommodate a larger academic load and eventually remain symptom free after a full school day.

School personnel should be aware that concussed students may exhibit increased difficulty with focusing, memory, learning and retaining new information, as well as being more impulsive and emotional. The school should develop a policy for making up missed assignments, tests and quizzes. This make-up plan should span a time equal to that which the student was absent.

In some situations, a 504 plan may be appropriate for student whose concussion symptoms last several months or longer. Section 504 is part of the Rehabilitation Act of 1973 and is designed to protect the rights of individuals with disabilities who are enrolled in programs that receive federal financial assistance from the U.S. Department of Education. Section 504 requires a school district to provide a "free appropriate public education" to each qualified student with a disability who is in the school district's jurisdiction regardless of the nature or severity of the disability. More information regarding Section 504 is available at choa.org/concussion.

Physical rest: Seven-step return-to-play program

As the student's symptoms improve, he will be able to begin the seven-step return-to-play program.

The seven-step program begins with complete rest until the symptoms subside. As the student's symptoms improve and he is able to increase the amount of time in school without symptoms worsening, he then may progress through the next steps, which include a gradual increase in physical demands, sports-specific activities and eventually physical contact. The final stage is clearance to return to play.

The seven steps involved in the return-to-play protocol are:

1. No activity; complete rest
2. Light aerobic activity (10 to 15 minutes or walking or stationary bike)
3. Moderate aerobic activity (20 to 30 minutes of jogging; light resistance training)
4. Intense aerobic activity (40 to 60 minutes of jogging/running sport-specific drills)
5. Controlled contact training drills
6. Full contact practice
7. Return to play

Note: Each step should take a minimum of 24 hours.

If symptoms return at any stage, the student should drop back to the previous level and progress after 24 hours of symptom-free rest.

Return-to-school and activities guidelines can be found in the appendix.

No athlete shall return to play until they are:

- Completely symptom free
- Remain symptom free after resuming a full school day
- Remain symptom free after progressing through Steps 1 through 6 of the return-to-play program
- Return to baseline neurocognitive functioning
- Receive written clearance from a qualified healthcare provider to return to play



Neurocognitive testing (ImPACT®)

Neurocognitive testing or neuropsychological testing in athletes began in the 1980s and has expanded in the last decade with the availability of computerized testing. Some studies indicate persistent neurologic impairment may exist even though symptoms resolve. Therefore, neurocognitive testing is a tool that can identify subtle cognitive impairment and aid in documenting an athlete's recovery from a concussion. Neurocognitive testing should not function as the sole determinant that a concussion has occurred or that a concussion has resolved. It is simply a concussion management tool and its role in concussion management is still debated among professionals in the field.

Our consensus on the role of computerized cognitive testing in the management of concussed patients is as follows:

1. The role of computerized cognitive tests in the management of concussions has not been fully established.
2. These tests may be used as a method to assess the degree of cognitive impairment following a concussion.
3. These tests may be used as a method to monitor progression (improvement or deterioration) following a concussion.
4. Computerized cognitive tests are most commonly used in athletes, especially when baseline testing was done prior to the concussion.
5. These tests are **NOT** mandatory for managing patients who have sustained a concussion.
6. These tests are **NOT** a substitute for the initial or subsequent clinical evaluations of patients who has sustained a concussion.

The most widely used neurocognitive test in the U.S. for athletes is ImPACT® or Immediate Post-Concussive Assessment and Cognitive Testing. It is a computer-based test that requires an Internet connection and takes about 30 minutes to complete. It measures an athlete's:

- Symptom inventory
- Verbal and visual memory
- Attention span
- Non-verbal problem solving
- Processing speed
- Reaction time

The results can be saved in a PDF format for e-mailing to doctors, coaches or other members of the concussion management team. The test can be administered by a certified athletic trainer, a school nurse, athletic director, team doctor or psychologist. It is recommended that test administrators complete training in giving and interpreting the test.

The ImPACT test can be given to an athlete before the season begins or before he receives a head injury. This is called a baseline test. Some schools recommend baseline testing for all athletes age 12 and above while others recommend baseline testing only for those participating in high-risk sports. It is recommended that baseline testing be completed every other year. The baseline testing can be especially useful for students who have pre-existing conditions that can cause cognitive scores to be lower than would be expected. Some of these conditions that may affect the results include psychiatric disorders, emotional problems, attention-deficit/hyperactivity disorder, learning disabilities, dyslexia and previous head injuries. One weakness of baseline neurocognitive testing is that an honest answer is not required when the athlete takes the test. Some athletes deliberately try to make a low score in order to make it more likely he will be able to "pass" the test in the event of a concussion during the season.

If baseline testing is not available in a concussed athlete, then age-matched norms are used to determine what the "normal" scores are for that individual student. Age-matched norms were found by testing a large number of individuals who did not have a concussion prior to taking the test.



Concussion management team roles

Concussion management in the student-athlete requires a coordinated effort among school personnel along with parents and athletes. This process starts with forming a concussion recovery team, or CRT. CRT members should advocate for academic and physical accommodations to reduce delays in the student's return to full, unrestricted academic and athletic activities.

Potential members of the CRT should be identified at the beginning of the school year in preparation that a student-athlete will suffer a concussion. This way, members will be aware of their role in concussion management and facilitate a smooth transition back into the classroom and the playing field.

CRT members include but are not necessarily limited to:

- Students
- Parents/guardians
- School administrator/guidance counselor
- Teachers
- School nurse
- Certified athletic trainer
- Physician

Students

The Return to Play Act of 2013 requires students be made aware of the risk of concussions. Encourage students to report symptoms to their coach, certified athletic trainer, school nurse, parents or other school personnel.

This should be emphasized at preseason team meetings as well as continuously throughout the season. It is recommended that students:

- Be aware of the risk of severe injury, permanent disability and even death that can occur if a second concussion is sustained before completely recovering from a concussion.
- Be aware of the signs and symptoms associated with concussions and the importance of reporting them to the coach, certified athletic trainer, school nurse or parent.
- Participate in the "buddy system" which encourages them to report concussion signs or symptoms to teammates.
- Follow instructions from their team physician or private physician.
- Be encouraged to inform teachers if they're having difficulty in the classroom.

- Participate in creating an environment on the field and the locker room where reporting signs and symptoms of a concussion is encouraged.

Parents/guardians

Parents or guardians play a vital role in managing their child's concussion. They must communicate with both the medical team and school personnel and often function as the primary advocate for their child. They may need to pick up their child from school during the day if he has symptoms as well as transport him to and from doctor's visits. It is recommended that parents:

- Familiarize themselves with the signs and symptoms of concussion.
- Understand that the Return to Play Act of 2013 requires them to immediately remove an athlete from play if he shows signs and symptoms of a concussion.
- Communicate appropriate medical information from the physician to school personnel.
- Create a home environment conducive for concussion recovery.
- Communicate with the school staff if the child is experiencing concussion symptoms at the end of the school day.
- Follow medical provider recommendations for return to activities at home and school.

School administrator/guidance counselor

The role of the school administrator is to follow the district's policies on concussion management. They should:

- Review the district's concussion policy with all staff.
- Arrange in-service training sessions for all staff and parents regarding concussion management in the school setting.
- Provide a written emergency action plan and communication devices for all school activities.
- Encourage members of the academic recovery team about their role in the management of the concussed student-athlete.
- Encourage open communication with the private physician, team physician, parents and school personnel.
- Encourage parents to participate in determining their child's needs at school.



Teachers

Teachers can assist concussed students by creating an environment and developing modified curricula that allow students to return to the classroom and minimize aggravating stimuli. They should:

- Be aware of the emotional and academic issues students with concussions face.
- Report academic issues to other members of the academic recovery team.
- Encourage students to report their classroom symptoms.
- Provide classroom academic support with assignment modification.
- Create a classroom environment free of distractions.
- Encourage open communication between the physician and parents.

School nurse

The school nurse is a team member who communicates with the physician, parents and school staff. He or she will collect documentation and orders from the medical provider and see that orders are implemented. The school nurse will also be an integral part of ongoing assessments during the academic recovery period. The school nurse should:

- Assess students who suffered an injury at school for signs and symptoms of a concussion. He or she must provide an area of observation and refer as appropriate.
- Communicate with parents regarding their child's status and recommend referral to physician if appropriate.
- Provide parents of students believed to have sustained a concussion with written and oral instructions for observation and criteria for seeking immediate emergency care.
- Assist in the implementation of medical providers' instructions for academic accommodations.
- Monitor the student's return-to-school activities, provide feedback to the medical provider and implement changes as necessary.
- Assist in developing a 504 plan if appropriate.
- Maintain records of school assessments and all written communication from the medical provider, including letters for return-to-play clearance.
- Perform post-concussive assessments including symptom inventory checklists as well as administering computerized neurocognitive testing of students
- Participate in the education of staff members in concussion recognition and management.

Certified athletic trainer (ATC)

The certified athletic trainer is often the only healthcare provider present at games and practices so he or she must be comfortable with the acute recognition and early management of concussions. ATCs receive training in concussion recognition and management during their education and certification process. Because of this, the Return to Play Act recognizes ATCs as a qualified medical professionals trained in the management of concussions. The ATC should:

- Oversee athletes taking a baseline neurocognitive test if directed by local policy.
- Educate student-athletes on the importance of recognizing and reporting signs and symptoms of concussion.
- Evaluate athletes on the field or in the training room who are suspected of having sustained a concussion and observe and refer as appropriate.
- Evaluate athletes and be able to determine if signs and symptoms warrant emergency referral to a medical facility.
- Provide parents and guardians with verbal and written instructions on observing the athlete for complications that warrant emergency care.
- Play a role in assisting the team or private physician request for accommodations.
- Monitor—with the school nurse—the student's return-to-school and physical activities, communicating each step with other members of the concussion management team.
- Oversee the athlete's seven-step return-to-play program and communicate progress to other members of the concussion management team.



Physician

The team physician or private physician plays an important role in the management of the concussed student-athlete. He or she will be involved in the initial assessment and establish the diagnosis of a concussion after an office appointment. After this visit, the physician must communicate information on the diagnosis and recommendations to the rest of the concussion recovery team (CRT). The physician must be aware that there are laws that govern confidentiality of medical information. This is referred to as HIPAA, or the Health Information Portability and Accountability Act. Therefore, the physician must receive consent from the parent or guardian to communicate medical information to school personnel.

The physician should:

- Oversee and approve educational programs for school personnel.
- Confirm the diagnosis of concussion.
- Provide, in writing, academic and physical restrictions to members of the CRT.
- Provide weekly updates to the CRT in writing on the student-athlete's progress and modification of academic and physical restrictions.
- Interpret cognitive function tests if administered at school.
- Provide written clearance for return to full academic and athletic activities when appropriate.



Children's Concussion Program

Comprehensive care

Several teams at Children's work together to treat concussion patients. This multidisciplinary approach helps make our program unique. Services include:

- Emergency
- Neurology
- Neuropsychology
- Neurosurgery
- Physiatry (Physical medicine and rehabilitation)
- Sports medicine
- Urgent care

Coordinated care

Our dedicated concussion nurse helps coordinate each child's care and serves as a resource for healthcare professionals. Our team works with each child's primary care doctor to help develop the plan of care.

Concussion Program nurse coordinator: 404-785-1111

Acknowledgements

These guidelines were developed or reviewed by a panel of advisors made up of the following participants:

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Appendix



[Insert school or organization name here]

Download this document at choa.org/concussionlaw to add your name and/or logo.

Concussion Policy Template

Date:

[Insert School/County or Recreational League* name] recognizes that adolescent athletes are particularly vulnerable to the effects of concussions.

In compliance with the passage of House Bill 284, and to ensure the ongoing safety of our youth athletes, the following protocols will be effective January 1, 2014:

- A. Prior to the beginning of each athletic season, an informational sheet emphasizing the risks of concussions shall be distributed to the parents/guardians of all youth athletes (ages 7 to 18).
- B. Any youth athlete who participates in youth athletics and exhibits signs of a concussion must be removed from the game, practice, competition or tryout and be evaluated by a healthcare provider.**
- C. Any youth athlete who is deemed by a health care as sustaining a concussion shall not be permitted to return to play until he/she receives clearance from a health care provider for a full or graduated return to play.

** By law, recreational leagues only have to comply with Part A of the policy above; however, it is strongly encouraged that leagues establish and implement a concussion management policy consistent with the school level requirements.*

*** The term 'healthcare provider' means a licensed physician or another licensed individual under the supervision of a licensed physician, such as a nurse practitioner, physician assistant, or certified athletic trainer who has received training in concussion evaluation and management.*

Concussions

What you need to know



What is the law?

Schools: House Bill 284, the Return to Play Act of 2013, requires all public and private schools to create a concussion policy that, at a minimum, includes these standards:

- Prior to the beginning of each athletic season, an information sheet that informs parents or legal guardians of the risk of concussions must be provided.
- If a youth athlete (ages 7 to 18) participating in a youth athletic activity exhibits signs or symptoms of a concussion, he must be removed from play and evaluated by a healthcare provider.
- Before a youth athlete can return to play, he must be cleared by a healthcare provider trained in the management of concussions.

Recreational Leagues: HB 284 requires recreational leagues to provide an information sheet on the risks of concussion at the time of registration to all youth athletes' (ages 7 to 18) parents or legal guardians.

What is a concussion?

It is a type of brain injury caused by trauma. It can be caused by a hard bump on or blow to or around the head, which causes the brain to move quickly inside the head.

You do not have to lose consciousness to have a concussion. If a concussion is not properly treated, it can make symptoms last longer and delay recovery. A second head trauma before recovery could lead to more serious injuries.

What are the signs and symptoms?

There are many signs and symptoms linked with concussion. Your child may not have any symptoms until a few days after the injury. Signs are conditions observed by other people and symptoms are feelings reported by the athlete.

Signs observed by others

- Appears dazed or stunned
- Moves clumsily
- Forgets plays
- Answers questions slowly
- Is unsure of game or opponent
- Shows behavior or personality changes

Symptoms reported by athlete

- Headache
- Fuzzy vision
- Nausea
- Feeling foggy
- Dizziness
- Concentration problems

For a full list of signs and symptoms visit choa.org/concussion.

What should you do if you suspect a concussion?*

- Do not let your child play with a head injury.
- Check on your child often after the injury for new or worsening signs or symptoms. If the symptoms are getting worse, take him to the nearest emergency department.
- Take your child to the doctor for even one symptom of a concussion.
- Do not give your child pain medicines without talking to your child's doctor. Your child should stop all athletic activity until his doctor says it is OK. Your child must stay out of play until he is cleared by a licensed healthcare provider.
- Educate your child on concussions and why he cannot play until the symptoms are gone. Your child will need a gradual return to school and activities.
- Tell your child's coaches, school nurses and teachers if he has a concussion.

*In case of an urgent concern or emergency, call 911 or go to the nearest emergency department right away.

Warning signs

Call your child's doctor right away if he has:

- New signs that his doctor does not know about
- Trouble knowing people or places
- Existing signs that get worse
- Slurred speech
- Headaches that get worse
- Loss of consciousness
- A seizure
- Blood or fluid coming from nose or ear
- Neck pain
- A large bump or bruise on scalp, especially in infants younger than 12 months
- Tiredness or is hard to wake
- Continued vomiting
- Weakness in the arms or legs

Where can I find more information?



Visit choa.org/concussion for return to school and activities guidelines, educational videos and general concussion information.

Concussion

Signs and Symptoms Evaluation

404-785-1111

choa.org/concussion

Signs observed by staff

- Appears dazed or stunned
- Confused about assignment
- Forgets plays
- Is unsure of game or opponent
- Moves clumsily
- Answers questions slowly
- Loses consciousness
(even temporarily)
- Shows behavior or personality changes
- Forgets events prior to hit
(retrograde amnesia)
- Forgets events after hit
(anterograde amnesia)

Symptoms reported by athlete

- Headache
- Nausea
- Balance problems
- Dizziness
- Double vision
- Fuzzy vision
- Sensitivity to light or noise
- Feeling sluggish
- Feeling foggy
- Change in sleep pattern
- Concentration problems
- Memory problems



Symptoms may worsen with exertion.
Athlete should not return to play that day and must be cleared by a physician before returning to activities.

Sideline

Cognitive Testing

404-785-1111

choa.org/concussion

Ask the athlete the following questions:

What city is this?

What month is it?

Who is the opposing team?

What day is it?

Ask the athlete to repeat the following three words:

Girl, dog, green

Ask the athlete the following questions:

What happened in the prior quarter/period?

What do you remember just prior to the hit?

What was the score of the game prior to the hit?

Do you remember the hit?

Ask the athlete to do the following:

Repeat the days of the week backward (starting with today).

Repeat these numbers backward:

63 (36 is correct) 419 (914 is correct)

Repeat the three words from earlier:

Girl, dog, green

Any failure should be considered abnormal.

The athlete should not return to play until cleared by a physician as a concussion may have occurred.

[Insert school or organization name here]

Download this document at choa.org/concussionlaw to add your name and/or logo.

Guardian Concussion Notification

Today, _____, 2 _____, at the _____ [insert name of event], _____ [insert player's name] was involved in activity that may have resulted in a concussion. We are making you aware of this potential injury and the signs/symptoms so that you can seek medical attention. **It is the policy of [insert school or organization name] that your child will not be allowed to participate in play, including games, practices, competitions, and tryouts, until he has been cleared by a healthcare provider.** A healthcare provider is a licensed physician or individual under the supervision of a licensed physician, such as a nurse practitioner, physician assistant, or certified athletic trainer who has received training in concussion evaluation and management.

There are many signs and symptoms linked with concussion. Your child may not have any symptoms until a few days after the injury. If your child shows signs of a concussion, you should seek medical attention. It is important to note that a child does not have to lose consciousness (pass out) to have a concussion. If a concussion is not properly treated, it can make symptoms last longer and delay recovery. A second head trauma before recovery could lead to more serious injuries.

Signs observed by you

- Appears dazed or stunned
- Forgets plays
- Is unsure of game or opponent
- Moves clumsily
- Answers questions slowly
- Shows behavior or personality changes

Symptoms reported by athlete

- Headache
- Nausea
- Dizziness
- Fuzzy vision
- Feeling foggy
- Concentration problems

For a full list of signs and symptoms visit choa.org/concussion.

What should you do?

- Do not let your child play with a head injury.
- Check on your child often after the injury for new or worsening signs or symptoms. If the symptoms are getting worse, take him to the nearest emergency department.
- Take your child to the doctor for any symptom of a concussion.
- Do not give your child pain medicines without talking to your child's doctor.
- Your child should stop all athletic activity until his doctor says it is OK. Your child must stay out of play until he is cleared by a licensed healthcare provider.
- Educate your child on concussions and why he cannot play until the symptoms are gone. Your child will need a gradual return to school and activities.
- Tell your child's coaches, school nurses and teachers if he has a concussion.
- Visit choa.org/concussion for return to school and activities guidelines, educational videos and general concussion information.

In case of an urgent concern or emergency, call 911 or go to the nearest emergency department right away.

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You have been notified by [insert school name or organization] that your child has possibly sustained a concussion. By signing and returning this form, you acknowledge that you have been provided with and read the information contained in the Concussion Notification Form.

Player's Team: _____ Age Group: _____

Player Name: _____ Gender: _____

Player Signature: _____ Date: _____

Parent/Legal Guardian Signature: _____ Date: _____

Team Official Signature: _____ Date: _____

Concussion guidelines for your child's return to school, book work and studies

Stage of healing	Home activity	School activity	Physical activity
Stage 1 — your child still has many symptoms and problems	– Complete rest in a quiet room – Allow as much sleep as possible – Limit things that require your child to think, focus, reason or remember – Remove any electronics and computers from your child's room – Remove any activity planners and “to-do” lists from your child's room – Give your child plenty of fluids to drink – Give your child plenty of carbohydrates to eat, such as whole grain breads and cereals, pasta and rice	– No school	See Stage 1 in next chart
Stage 2 — your child still has some symptoms and problems	– Quiet room – Allow as much sleep as possible – Allow your child to use TV, video games, texting, tweeting and email for a short time—less than 2 hours a day – Help your child to not stress over missed school work – Continue with fluids and carbohydrates as in Stage 1	– May return to school for one-half day – Attend core classes only – Attend shortened class time – Rest in nurse's office between classes and as needed – No tests or quizzes – Use preprinted class notes – Short homework assignments—work 20 minutes at a time with rest breaks in between – Talk with school nurse or teacher about a 504 plan to help to make sure special needs are met during his school day	See Stage 2 in next chart
Stage 3 — your child's symptoms and problems have gone away	– Slowly return to watching TV, playing video games and texting – Allow more active family interactions	– Full day of classes – Gradual return to class work, including make-up work, tests, quizzes – May take one test or quiz a day with extra time as needed to complete – Tell the teacher or school nurse if any symptoms or problems return	See Stages 2-4 in next chart
Stage 4 — your child seems back to normal	– Normal home and social interactions	– Normal school work and studies	See Stages 5-7 in next chart



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Concussion guidelines for your child's return to sports, play and activities

Stage of healing	Activity allowed	Examples of sports	Examples of other activities	Goal
1	- No activity - Complete cognitive and physical rest	Complete physical rest	- Quiet time with rest - Avoid groups, videos, reading, computers, video games, cell phones, noisy places	- Brain rest and healing - Become free of symptoms
2	Light aerobic activity	10-15 minutes of walking or stationary bike - Light sweat on the brow - Slight increase in breathing rate	- Walk in park or neighborhood - Avoid group activities	Increase heart rate to 30-40 percent max
3	- Moderate aerobic activity - Light resistance training	20-30 minutes of jogging or stationary bike - Arm curls, shoulder raises, leg lifts with weights that can be comfortably lifted - One set of 10 repetitions for each activity	- Supervised play - Low risk activities such as dribbling a ball, playing catch, changing directions, jumping, side-to-side slides, chasing a ball or catching a ball on the run	- Increase heart rate to 40-60 percent max - Add resistance - Use eyes to track objects
4	- Intense aerobic activity - Moderate resistance training - Sport-specific exercise	40-60 minutes of running or stationary bike - Same resistance exercises with weight for three sets of 10 reps - Pre-competition warm-up such as passing a soccer ball, throwing a football or doing ladder drills	- Supervised play - Moderate-risk activities—no head contact activities, such as balance and agility drills - Can sweat and breathe heavy	- Increase heart rate to 60-80 percent max - Increase resistance - Mimic the sport
5	Controlled-contact training drills	60-90 minutes of time on the field, court or mat for specific drills - Take part in normal practice session - Contact that is normally part of the sport—only use items that “do not hit back” such as a sled in football - Recheck for symptoms or problems often	- Free play - Run and jump as able - Full return to physical education (PE) - Recheck for symptoms or problems often	Mimic the sport or free play without the risk of head injury
6	Full-contact practice	After OK from the doctor, may take part in normal training activities	With parent or adult supervision, may take part in normal activities	- Build confidence - Assess skills
7	Return to play	Normal game play	Normal playtime and activities	No restrictions

Maximum heart rate is determined by subtracting the athlete's age from 220 and multiplying by the percentage. For example:

- Your target or ideal heart rate for exercise during Stage 2 is usually 30 to 40 percent of your maximum heart rate.
- To find your maximum heart rate, subtract your age from 220.
- If you are 15 years old, subtract 15 from 220 = 205. Next, multiply that number by 30 and 40 percent. This will give you a target heart rate for exercise in Stage 2.
- 205 times 30 percent = 62 beats a minute. 205 times 40 percent = 82 beats a minute.
- This means that your target heart range for exercise in Stage 2 is between 62 and 82 beats a minute.

- Allow 24 hours between each activity stage in the chart. **This means that it will take at least seven days to return to full activity.**
- For your child to move from one stage to the next, he must be able to do an activity at 100 percent without symptoms or problems for 24 hours.
- If any symptoms return, it means his brain is not ready for the next stage and he should drop back to the previous stage.
- Once your child has no symptoms again for 24 hours, he can try the activities in that stage again.

Concussion Program adapted from the Zurich Concussion Conference November 2008, Br J Sports Med 2009; 43:i76-i84.

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Return to physical activity following concussion

Baseball/softball

Stage	Activity	Baseball/softball-specific exercise	Objective of the stage
1	- No physical activity - Complete physical and cognitive rest	No activity	Recovery and elimination of symptoms
2	Light aerobic activity	10 to 15 minutes of walking at home or at field, or stationary bike	Add light aerobic activity and monitor for symptom return
3	- Moderate aerobic activity - Light resistance training	20 to 30 minutes of jogging - Light weight lifting (one set of 10 reps)	Increase aerobic activity and monitor for symptom return
4	Noncontact baseball/softball-specific drills	Interval throwing program, bullpen pitching, fielding ground balls, double plays, catching fly balls, running bases, pick-off attempts, catcher coming out of the crouch, dry cuts, bunting, hitting off the tee	- Maximize aerobic activity - Accelerate to full speed with change of directions (cuts) - Introduce rotational head movements - Monitor for symptoms
5	Limited contact baseball/softball drills	Hitting off a pitching machine with progression to live batting practice	- Maximize aerobic activity - Add deceleration/rotational forces in controlled setting - Monitor for symptoms
6	Full practice (after medical clearance)	Normal training activities	- Frequent assessments throughout the practice - Monitor for symptoms
7	Return to play	Normal game play	- Assess frequently - Monitor for symptoms

May begin Stage 2 when symptoms are markedly diminished, and can tolerate a partial school day.

May begin Stage 3 when a full school day is tolerated.

May progress to the next stage every 24 hours as long as symptoms do not worsen.

Always wear a batting helmet when around hitting/batting area.



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Return to physical activity following concussion

Soccer

Stage	Activity	Soccer-specific exercise	Objective of the stage
1	- No physical activity - Complete physical and cognitive rest	No activity	Recovery and elimination of symptoms
2	Light aerobic activity	10 to 15 minutes of walking at home or at field, or stationary bike	Add light aerobic activity and monitor for symptom return
3	- Moderate aerobic activity - Light resistance training	20 to 30 minutes of jogging - Light weight lifting (one set of 10 reps)	Increase aerobic activity and monitor for symptom return
4	Noncontact soccer-specific drills	Inside/outside, top tapping the ball, dribbling in a straight line, dribbling around cones, chipping, goal-keeper punts, goal-keeper catches, long and short passing (inside foot and instep), shooting, volleys	- Maximize aerobic activity - Accelerate to full speed with change of directions (cuts) - Introduce rotational head movements - Monitor for symptoms
5	Limited contact soccer drills	Ball-tossed headers from knees (progress to standing then jumping), goal-keeper dives from knees (progress to standing), 1-on-1 (progress to 2-on-2, 3-on-3, etc.)	- Maximize aerobic activity - Add deceleration/rotational forces in controlled setting - Monitor for symptoms
6	Full practice (after medical clearance)	Normal training activities	- Frequent assessments throughout the practice - Monitor for symptoms
7	Return to play	Normal game play	- Assess frequently - Monitor for symptoms

May begin Stage 2 when symptoms are markedly diminished, and can tolerate a partial school day.

May begin Stage 3 when a full school day is tolerated.

May progress to the next stage every 24 hours as long as symptoms do not worsen.



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Return to physical activity following concussion

Lacrosse (Girls)

Stage	Activity	Lacrosse-specific exercise	Objective of the stage
1	- No physical activity - Complete physical and cognitive rest	No activity	Recovery and elimination of symptoms
2	Light aerobic activity	10 to 15 minutes of walking at home or at field, or stationary bike	Add light aerobic activity and monitor for symptom return
3	- Moderate aerobic activity - Light resistance training	20 to 30 minutes of jogging with stick - Light weight lifting (one set of 10 reps)	Increase aerobic activity and monitor for symptom return
4	Lacrosse-specific drills	Cradling, catching, scooping, fielding ground balls, shooting, change of direction, give and go, waterfall drill, hamster drill, pinwheel drill, eagle eye drill	- Maximize aerobic activity - Accelerate to full speed with change of directions (cuts) - Introduce rotational head movements - Monitor for symptoms
5	Limited-contact lacrosse drills	Riding after the shot, riding off the end line, pick and roll, 1 v 1 scramble, 3 v 2, 3 v 4 <i>*Wearing goggles</i>	- Maximize aerobic activity - Add deceleration/rotational forces in controlled setting - Monitor for symptoms
6	Full practice (after medical clearance)	Normal training activities	- Frequent assessments throughout the practice - Assess frequently during line changes - Monitor for symptoms
7	Return to play	Normal game play	- Assess frequently - Monitor for symptoms

May begin Stage 2 when symptoms are markedly diminished.

May begin Stage 3 when a full school day is tolerated.

May progress to the next stage every 24 hours as long as symptoms do not worsen.



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Return to physical activity following concussion

Lacrosse (Boys)

Stage	Activity	Lacrosse-specific exercise	Objective of the stage
1	- No physical activity - Complete physical and cognitive rest	No activity	Recovery and elimination of symptoms
2	Light aerobic activity	10 to 15 minutes of walking at home or at field, or stationary bike	Add light aerobic activity and monitor for symptom return
3	- Moderate aerobic activity - Light resistance training	20 to 30 minutes of jogging with helmet and gloves - Light weight lifting (one set of 10 reps)	Increase aerobic activity and monitor for symptom return
4	Noncontact lacrosse-specific drills	Cradling, catching, scooping, fielding ground balls, shooting, change of direction, give and go, waterfall drill, hamster drill, pinwheel drill, eagle eye drill <i>*Start with helmet and gloves, progress to full pads if symptom-free</i>	- Maximize aerobic activity - Accelerate to full speed with change of directions (cuts) - Introduce rotational head movements - Monitor for symptoms
5	Limited contact lacrosse drills	Riding after the shot, riding off the end line, pick and roll, 1 v 1 scramble, 3 v 2, 3 v 4 <i>*Full pads</i>	- Maximize aerobic activity - Add deceleration/rotational forces in controlled setting - Monitor for symptoms
6	Full practice (after medical clearance)	Normal training activities	- Frequent assessments throughout the practice - Assess frequently during line changes - Monitor for symptoms
7	Return to play	Normal game play	- Assess frequently - Monitor for symptoms

May begin Stage 2 when symptoms are markedly diminished, and can tolerate a partial school day.

May begin Stage 3 when a full school day is tolerated.

May progress to the next stage every 24 hours as long as symptoms do not worsen.



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Return to physical activity following concussion

Ice hockey

Stage	Activity	Ice hockey-specific exercise	Objective of the stage
1	- No physical activity - Complete physical and cognitive rest	No activity	Recovery and elimination of symptoms
2	Light aerobic activity	10 to 15 minutes of walking at home or at field, or stationary bike	Add light aerobic activity and monitor for symptom return
3	- Moderate aerobic activity - Light resistance training	20 to 30 minutes of skating with helmet and gloves - Light weight lifting (one set of 10 reps)	Increase aerobic activity and monitor for symptom return
4	Noncontact ice hockey-specific drills	Skating backward and laterally, skating with the puck, stick handling, face off, passing, shooting, shadow positioning, goalie positioning	- Maximize aerobic activity - Accelerate to full speed with change of directions (cuts) - Introduce rotational head movements - Monitor for symptoms
5	Limited contact ice hockey drills	Checking against pad, progress to back in and cut off drill, curls, forecheck drill, open ice stand-up drill	- Maximize aerobic activity - Add deceleration/rotational forces in controlled setting - Monitor for symptoms
6	Full practice (after medical clearance)	Normal training activities	- Frequent assessments throughout the practice - Assess frequently during line changes - Monitor for symptoms
7	Return to play	Normal game play	- Assess frequently - Monitor for symptoms

May begin Stage 2 when symptoms are markedly diminished, and can tolerate a partial school day.

May begin Stage 3 when a full school day is tolerated.

May progress to the next stage every 24 hours as long as symptoms do not worsen.



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Return to physical activity following concussion

Football

Stage	Activity	Football specific exercise	Objective of the stage
1	- No physical activity - Complete physical and cognitive rest	No activity	Recovery and elimination of symptoms
2	Light aerobic activity	10 to 15 minutes of walking at home or at field, or stationary bike	Add light aerobic activity and monitor for symptom return
3	- Moderate aerobic activity - Light resistance training	20 to 30 minutes of jogging with helmet - Light weight lifting (one set of 10 reps)	Increase aerobic activity and monitor for symptom return
4	Noncontact football-specific drills	Moving in/out of three-point stance, bear crawls through tunnel, tires, step over bags (vertical and lateral), QB/center exchange, QB drop backs, passing, break downs and plant, jump cuts, backpedaling, match the hips, up/downs <i>*Start without helmets; progress to helmets and shells if symptom free</i>	- Maximize aerobic activity - Accelerate to full speed with change of directions (cuts) - Introduce rotational head movements - Monitor for symptoms
5	Limited contact football drills	- Stage 4 workout in full pads - Hit/push pads then sled (focus on technique—head up, square up, stay low), step and hit, run and hit, leverage drill, punch drill	- Maximize aerobic activity - Add deceleration/rotational forces in controlled setting - Monitor for symptoms
6	Full contact practice (after medical clearance)	Normal training activities	- Frequent assessments throughout the practice - Monitor for symptoms
7	Return to play	Normal game play	- Assess frequently - Monitor for symptoms - Consider one side of the ball only, no special-teams play

May begin Stage 2 when symptoms are markedly diminished, and can tolerate a partial school day.

May begin Stage 3 when a full school day is tolerated.

May progress to the next stage every 24 hours as long as symptoms do not worsen.



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Return to physical activity following concussion

Basketball

Stage	Activity	Basketball-specific exercise	Objective of the stage
1	- No physical activity - Complete physical and cognitive rest	No activity	Recovery and elimination of symptoms
2	Light aerobic activity	10 to 15 minutes of walking at home or at field, or stationary bike	Add light aerobic activity and monitor for symptom return
3	- Moderate aerobic activity - Light resistance training	20 to 30 minutes of jogging - Light weight lifting (one set of 10 reps)	Increase aerobic activity and monitor for symptom return
4	Noncontact basketball-specific drills	Passing, dribbling, stationary shooting (progress to jump shots), individual post moves, solo rebounding, tip drill, lay-up drill, three man weave, defensive slides, suicides, shadowing plays	- Maximize aerobic activity - Accelerate to full speed with change of directions (cuts) - Introduce rotational head movements - Monitor for symptoms
5	Limited contact basketball drills	Post moves and rebounding with pad contact (progress to player contact)	- Maximize aerobic activity - Add deceleration/rotational forces in controlled setting - Monitor for symptoms
6	Full practice (after medical clearance)	Normal training activities	- Frequent assessments throughout the practice - Monitor for symptoms
7	Return to play	Normal game play	- Assess frequently - Monitor for symptoms

May begin Stage 2 when symptoms are markedly diminished, and can tolerate a partial school day.

May begin Stage 3 when a full school day is tolerated.

May progress to the next stage every 24 hours as long as symptoms do not worsen.



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Return to physical activity following concussion

Wrestling

Stage	Activity	Wrestling-specific exercise	Objective of the stage
1	- No physical activity - Complete physical and cognitive rest	No activity	Recovery and elimination of symptoms
2	Light aerobic activity	10 to 15 minutes of walking at home or at field, or stationary bike	Add light aerobic activity and monitor for symptom return
3	- Moderate aerobic activity - Light resistance training	20 to 30 minutes of jogging - Light weight lifting (one set of 10 reps) - Push-ups, sit-ups, pull-ups	Increase aerobic activity and monitor for symptom return
4	Minimal contact wrestling drills	Shooting single/double leg, hand fighting, sit-outs from a referee's position, stand-up escapes from referee's position, leg riding All drills done at half speed	- Maximize aerobic activity - Accelerate to full speed with change of direction - Introduce rotational head movements - Monitor for symptoms
5	Limited contact wrestling drills	- Full-speed take downs, break downs, outside carry - Full-speed shots - Pinning combinations	- Maximize aerobic activity - Add deceleration/rotational forces in controlled setting - Monitor for symptoms
6	Full practice (after medical clearance)	Live wrestling	- Frequent assessments throughout the practice - Monitor for symptoms
7	Return to play	Normal game play	- Assess frequently - Monitor for symptoms

May begin Stage 2 when symptoms are markedly diminished, and can tolerate a partial school day.

May begin Stage 3 when a full school day is tolerated.

May progress to the next stage every 24 hours as long as symptoms do not worsen.



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